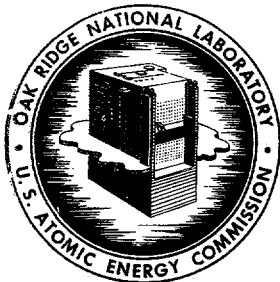


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62-3-38

DATE: March 14, 1962
SUBJECT: LABORATORY FACILITIES - WASTE DISPOSAL
Report for January 1962
TO: Distribution
FROM: J. F. Manneschildt

COPY NO. 29

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Inventory of Total Activity Discharged

A summary of the total liquid and gaseous activity discharged to the environment from the Laboratory waste disposal system during the month of January is given in Table 1. Also shown in Table 1, are the released quantities of the three most significant radionuclides - Sr^{90} , Ru^{106} , and Cs^{137} . Routine samples were taken from the Settling Basin - Waste Treatment Plant discharge; the seven process waste monitoring stations; the seepage streams in the waste pit area; White Oak Creek and Melton Branch; and the three principal process stacks. The locations of all but the process waste sampling stations are shown in Figure 1. Data on the White Oak Dam discharge were obtained from the Health Physics Division. The discharge designated "Burial Ground No. 4 and Miscellaneous Laboratory Drainage to White Oak Creek" is arrived at by difference between the radioactivity found in White Oak Creek, just north of its confluence with Melton Branch, and that known to be discharged from the Settling Basin - Waste Treatment Plant.

Process Waste Treatment and Discharge to White Oak Creek

Approximately 12,000,000 gals. of low level waste, the entire Laboratory output, was processed during the month of January. This volume is only slightly greater than the average monthly discharge for 1961. (See Figure 2). A total of 1.26 c. of activity, including 0.7 c. Sr^{90} , were discharged to White Oak Creek. A relatively low decontamination factor of 58% was attained at the treatment plant which may be attributed to mechanical failure of a sludge scraper. This piece of equipment has since been repaired. 70% of the activity

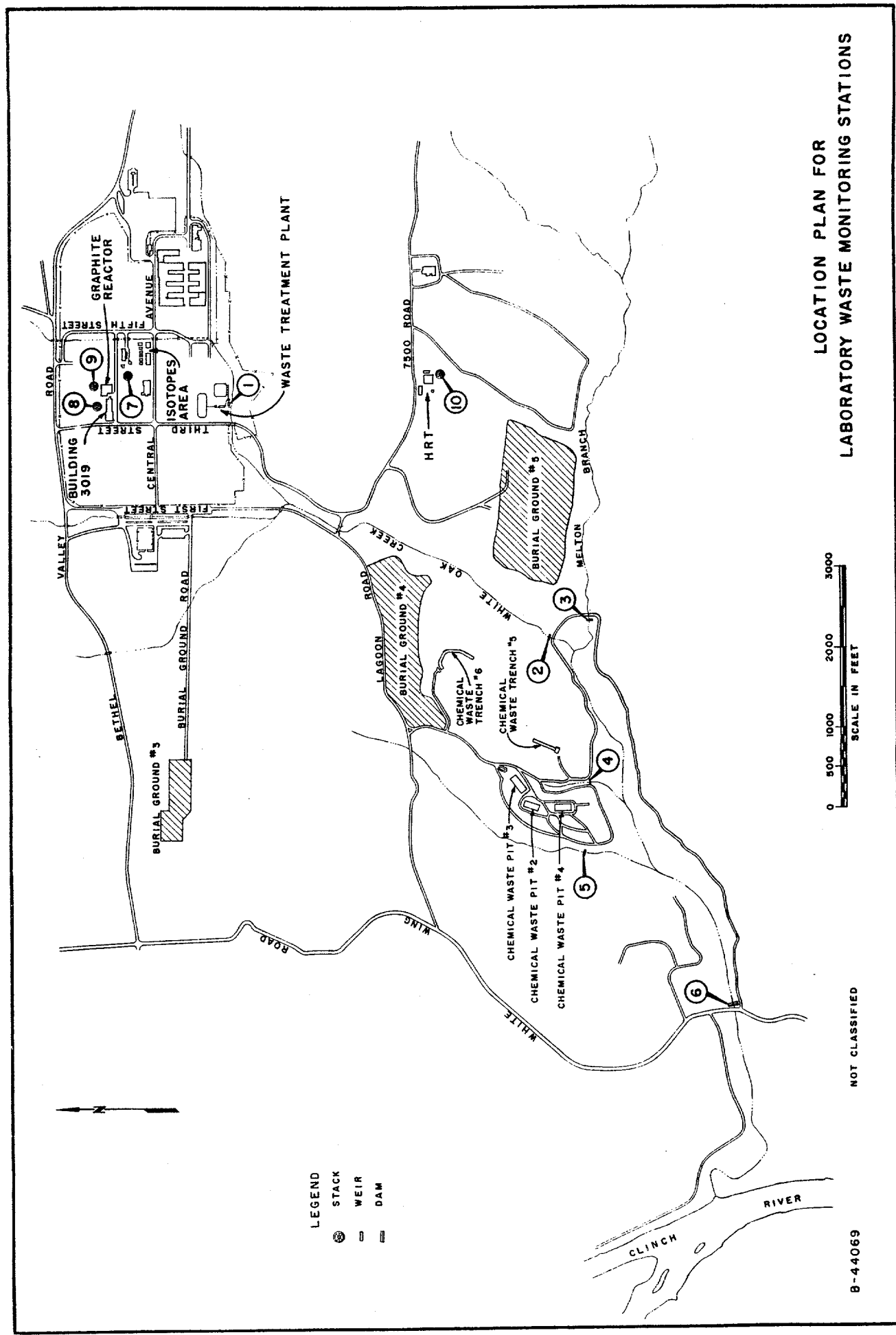
TABLE 1
SUMMARY OF TOTAL LIQUID AND GASEOUS ACTIVITY DISCHARGED

SOURCE	MONITORING STATION NUMBER ¹	ACTIVITY (Curies)			
		Sr ⁹⁰	Ru ¹⁰⁶	Cs ¹³⁷	TOTAL ²
Liquid Waste					
Process Waste to White Oak Creek	1	0.7	0.02	0.2	1.3
Burial Ground No. 4 and Miscellaneous Laboratory Drainage to White Oak Creek	2	0	0	0	0
7500 Waste to Melton Branch	3	0.02	0.008	0.01	0.06
East Waste Pit Seepage to White Oak Creek	4	0.001	489.	0.03	490.
West Waste Pit Seepage to White Oak Creek	5	0.006	271.	0.04	272.
Total Liquid Waste Discharged to White Oak Lake		0.7	760.	0.3	763.
White Oak Dam to Clinch River	6	2.2	234.	1.8	254.
Gaseous Waste ³					
3039 Stack	7				2.36
3020 Stack	8			Less than 0.01	
3018 Stack	9				0.37
7500 Stack	10				- -
Total Gaseous Waste Discharged to Environment					2.73

¹ Refers to Fig. 1.

² Includes other nuclides not listed here.

³ Activity primarily ¹³¹I as noted in text.



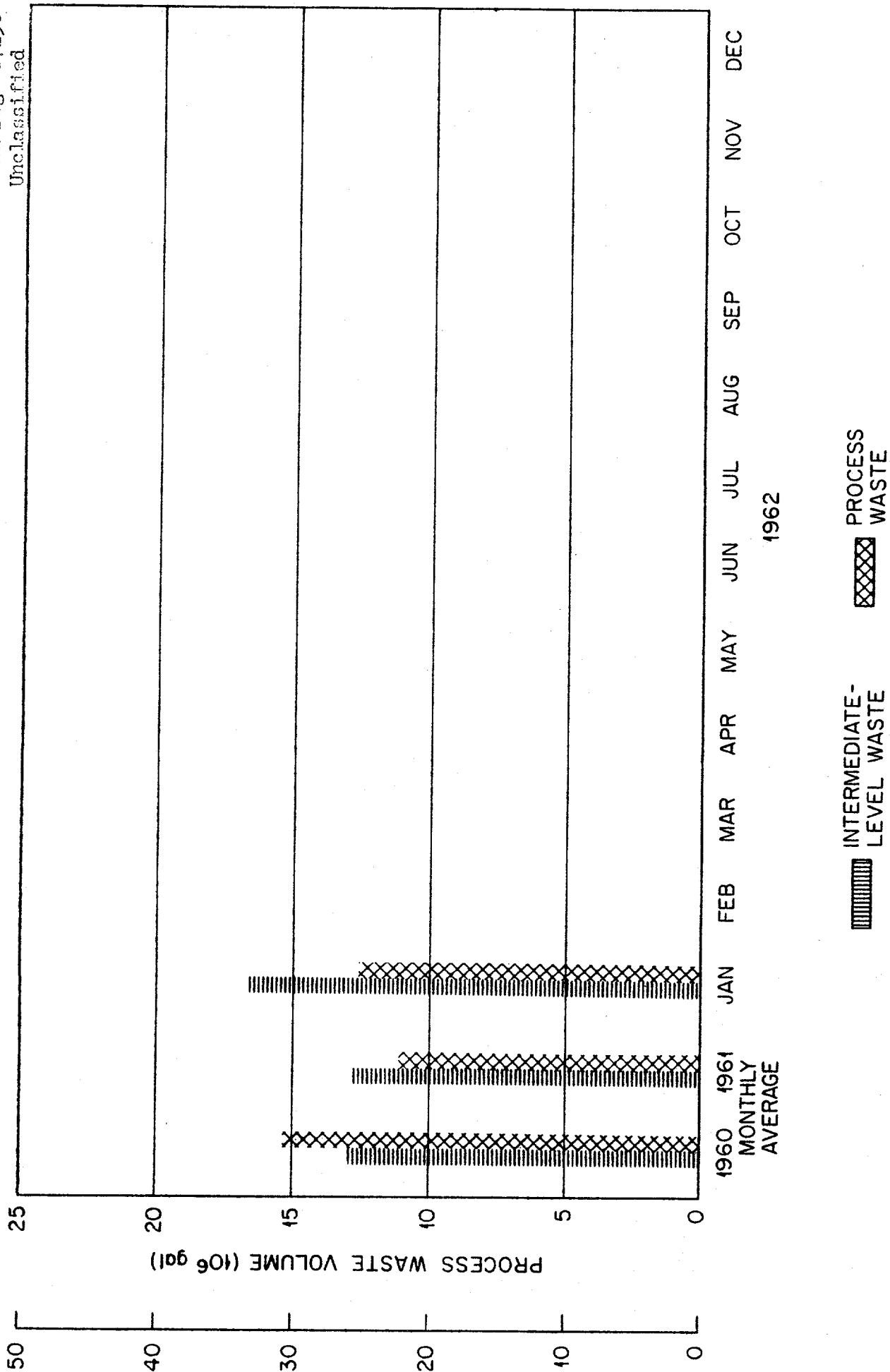


Fig. 2. Liquid Waste Volumes.

found in the process waste originated in the Reactor Area; however, there were no abnormal releases of activity during the month.

A summary of waste treatment plant operations is given in Table 2.

Intermediate Level Waste

Total transfer to the disposal area was 20% below last month, reflecting the cessation of clean-up activities at Building 3505.

Major contributors to the system were as follows:

1.	Radioisotopes Processing Area	64,500 gals
2.	4500 Area	33,000 gals
3.	Reactor Operations	27,900 gals
4.	Building 3019	25,200 gals
5.	Fission Products Development Laboratory	19,600 gals
6.	Segmenting Cells (Building 3026)	11,600 gals

More complete data on transfers to the pits and trench are given in Table 3.

Creek Monitoring

The total activity and Sr activity discharged to White Oak Creek are shown in Figure 3.. Data are presented monthly for 1962 and, for comparison, the average monthly discharges for 1961 are given. Total activity is arrived at by summation of the activities contributed by five major sources (Monitoring Stations No. 1 - 5) and appears in the Summary (Table 1) as "Total Liquid Waste Discharged to Environment".

Both the total activity and the Sr activity discharges increased slightly during the month of January. Past experience would indicate that further high releases may be expected as long as the heavy

TABLE 2

PROCESS WASTE TREATMENT AND DISCHARGE TO WHITE OAK CREEK

WASTE VOLUME TREATED THIS MONTH: 11.6×10^6 galsTOTAL WASTE VOLUME DISCHARGED
TO WHITE OAK CREEK THIS MONTH: 12.7×10^6 gals

NUCLIDES	PLANT INFLUENT (Curies)	PLANT EFFLUENT (Curies)	PER CENT REMOVED	DISCHARGE TO WHITE OAK CREEK (Curies)
Sr^{89}	None detected	None detected	- -	None detected
Sr^{90}	1.7	0.8	53	0.7
$\text{Ru}^{103,106}$	0.04	0.05	0	0.02
Co^{60}	0.1	0.05	50	0.04
Cs^{137}	0.9	0.3	67	0.2
TRE	0.9	0.3	67	0.3
Total	3.6	1.5	58	1.3

TABLE 3
ACTIVITY TRANSFERRED TO PITS AND TRENCH

NUCLIDE	TRENCH NO. 5, CURIES				PITS 2, AND 4, CURIES			
	This Month	Year to Date	Year 1961	Total to Date	This Month	Year to Date	Year 1961	Total to Date
Sr ⁸⁹	0	0	110	123	0	0	92	
Sr ⁹⁰	23	23	1,116	1,532	68	68	1,565	
Ru ¹⁰⁶	31	31	830	2,442	88	88	757	
Cs ¹³⁷	485	485	13,121	14,885	1,279	1,279	12,889	
TRE	30	30	41	749	81	81	837	
Total	569	569	16,181	20,694	1,516	1,516	16,148	501,876

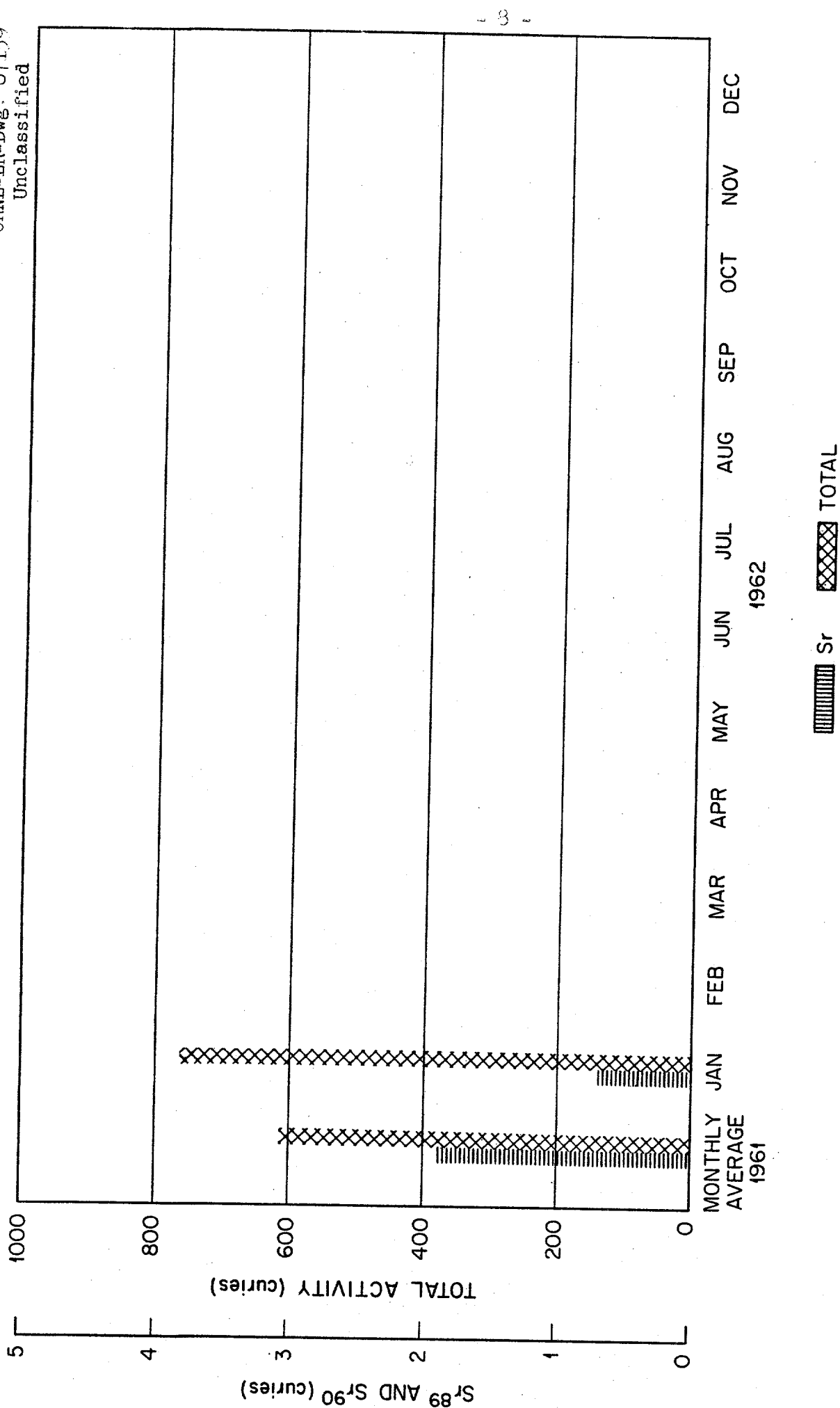


Fig. 3. Liquid Activity Discharge to White Oak Creek.

rainfall continues. January's total release (763 c.) does not greatly exceed the monthly average for 1961 (617 c.), however, and the Sr discharge (0.7 c.) is only 37% of the monthly average for the past year (1.9 c.).

Gaseous Waste Monitoring

Figure 4 is a plot of gamma activity discharge data for the principal Laboratory stacks - 3039, 3018, and 3020. Total activity is calculated from the activities accumulated on both a filter and a charcoal cartridge thru which is pumped a particular sample stream. Filterable activity is calculated from the nuclides deposited on the filter alone. The difference in magnitude of the two types of activity necessitated the use of two ordinates.

Stack activity discharges continue to be significantly low. While the release for January was 77% higher than that for December it was well below the reported monthly average for 1961 (3.5 c.¹). This is undoubtedly due in part to a change in sampling location at the 3039 Stack.

¹In considering the average gaseous activity release for 1961 it must be remembered that sampling of the 3039 Stack was first carried out at ground level and then, starting in September, at the 50 ft. level using the in-stack sampler. A twelve months average using data from an in-stack sampler would undoubtedly have been higher than the 3.5 c. noted above because of the higher efficiency of that type of sampler.

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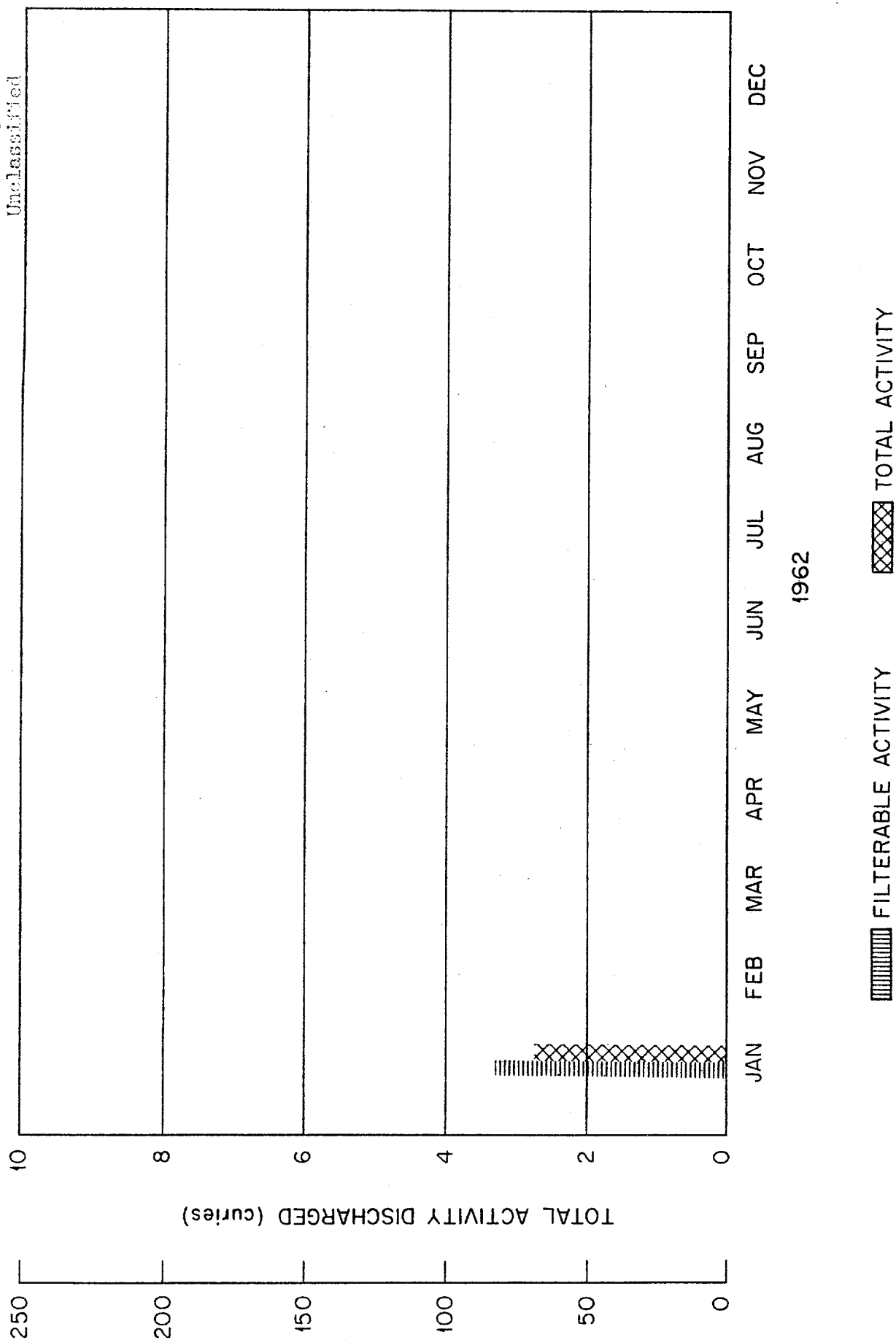


Fig. 4. Gaseous Activity Discharge to Environment.

The scheduled erection of the permanent balcony on the stack necessitated the removal of the scaffold and all of the monitoring and sampling equipment operating at the 50 ft level. At that time (January 15) use of the in-stack sampler was temporarily discontinued and sampling at the ground-level station was begun.

The activity observed during January was almost entirely I^{131} and the greater part was emitted during two periods in the month when iodine processing was being carried out in the Radioisotopes Area. Only trace amounts of other nuclides were detected during the period and there were no abnormal releases at any time.

Off-Gas System

Extremely cold weather caused a failure of the off-gas system on one occasion during the month. After making immediate interim alterations to prevent a re-occurrence, steps were taken to provide permanent weatherization of the facility.

Design of New Gaseous Waste Monitoring Equipment

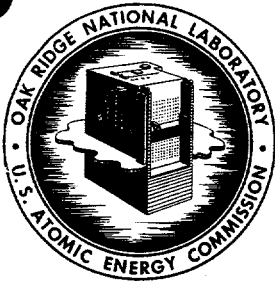
Site preparation for the erection of the permanent balcony on the 3039 Stack necessitated the termination of the three probe tape monitor experiment. Testing will be resumed after construction is completed and the new probe assemblies are installed.

Waste Monitoring Control Center

The moving of instrumentation into the Control Center was begun and the initial tie-ins were made to the manhole monitoring stations. It is estimated that the overall installation is approximately 15% completed.

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CENTRAL FILES NUMBER

62-5-64

COPY NO. 29

DATE: May 22, 1962
SUBJECT: LABORATORY FACILITIES - WASTE DISPOSAL
Report for March 1962
TO: Distribution
FROM: J. F. Manneschildt

This document has been approved for release
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Technical Information Officer Date
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Inventory of Total Activity Discharged

A summary of the total liquid and gaseous activity discharged to the environment from the Laboratory waste disposal system during the month of March is given in Table 1. Also shown in Table 1, are the released quantities of the three most significant radionuclides Sr^{90} , Ru^{106} , and Cs^{137} . Routine samples were taken from the Settling Basin - Waste Treatment Plant discharge; the seven process waste monitoring stations and the Diversion Box; the seepage streams in the waste pit area; White Oak Creek and Melton Branch; and the three principal process stacks. The locations of all but the process waste sampling stations are shown in Figure 1. The discharge designated "Burial Ground No. 4 and Miscellaneous Laboratory Drainage to White Oak Creek" is arrived at by difference between the radioactivity found in White Oak Creek, just north of its confluence with Melton Branch, and that known to be discharged from the Settling Basin - Waste Treatment Plant. Data on the White Oak Dam discharge were obtained from the Health Physics Division.

Process Waste Treatment and Discharge to White Oak Creek

Slightly over 12,000,000 gallons of low level waste passed through the Waste Treatment Plant during the month of March. The plant operated at an overall efficiency of 60% and 1.9 curies of radioactivity were discharged to White Oak Creek. The predominant activity was Sr^{90} , most of which originated in the overflow from the Building 3505 storage canal. The low operating efficiency of the treatment plant is attributed to mechanical difficulties experienced during the period and to the presence of large quantities of detergent in the waste water. Except for the radioactivity coming from the storage canal, mentioned above, there were no aberrant or significant releases during the month. Process waste volumes are shown in Figure 2; operational data for the treatment plant

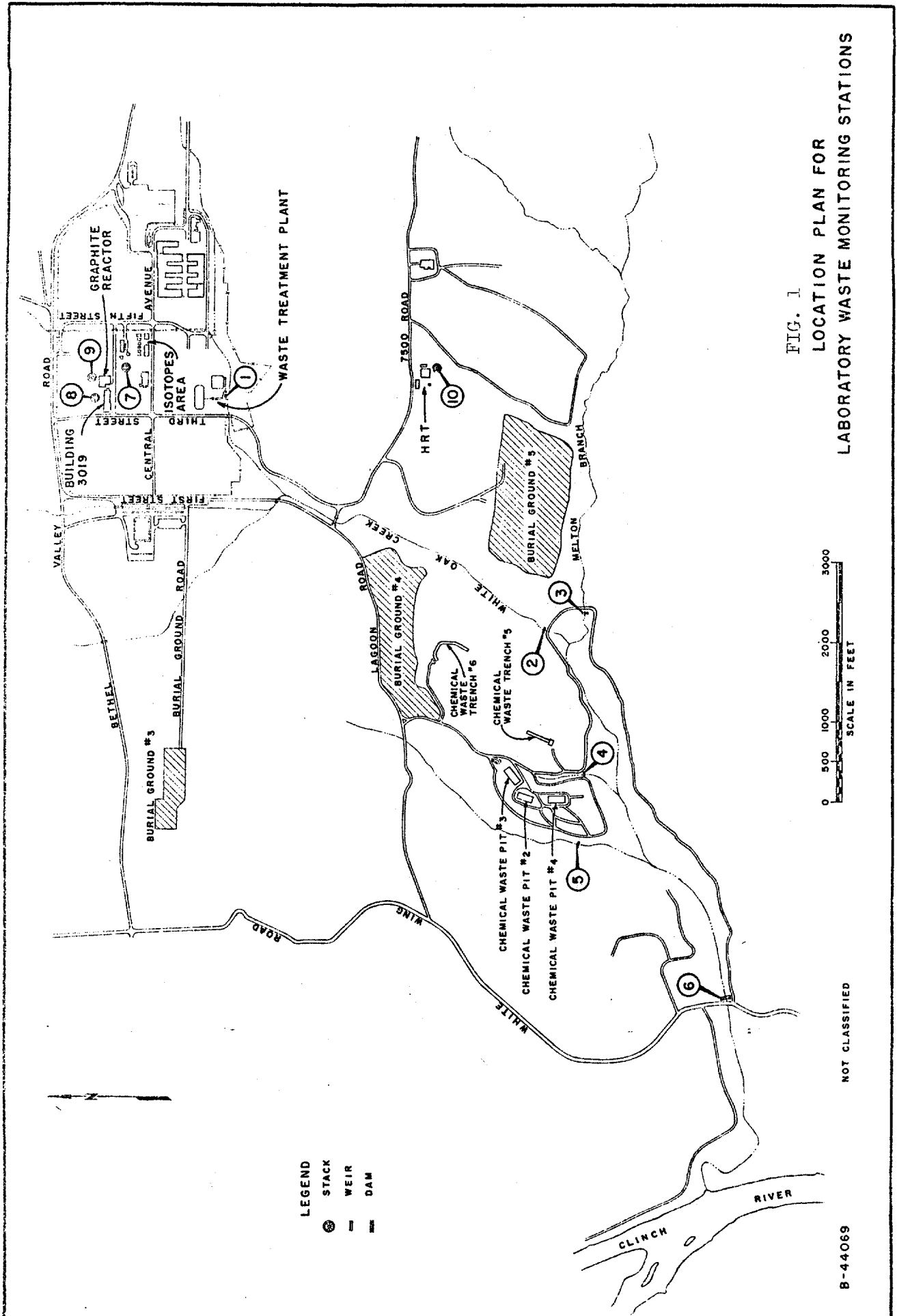
TABLE 1
SUMMARY OF TOTAL LIQUID AND GASEOUS ACTIVITY DISCHARGED

SOURCE	MONITORING STATION NUMBER ¹	ACTIVITY (Curies)			
		Sr ⁹⁰	Ru ¹⁰⁶	Cs ¹³⁷	TOTAL ²
Liquid Waste					
Process Waste to White Oak Creek	1	1.0	0.01	0.4	1.9
Burial Ground No. 4 and Miscellaneous Laboratory Drainage to White Oak Creek	2	-	0.07	-	0.07
7500 Waste to Melton Branch	3	0.1	0.003	0.007	0.1
East Waste Pit Seepage to White Oak Creek	4	0.0004	231.	0.03	233.
West Waste Pit Seepage to White Oak Creek	5	0.0004	121.	0.02	122.
Total Liquid Waste Discharged to White Oak Lake		1.1	352.	0.5	357.
White Oak Dam to Clinch River	6	1.3	253.	0.8	261.
Gaseous Waste ³					
3039 Stack	7				0.74
3020 Stack	8			Less Than	0.01
3018 Stack	9				0.12
7500 Stack	10				-
Total Gaseous Waste Discharged to Environment					0.86

¹ Refers to Fig. 1.

² Includes other nuclides not listed here.

³ Activity primarily I¹³¹ as noted in text.



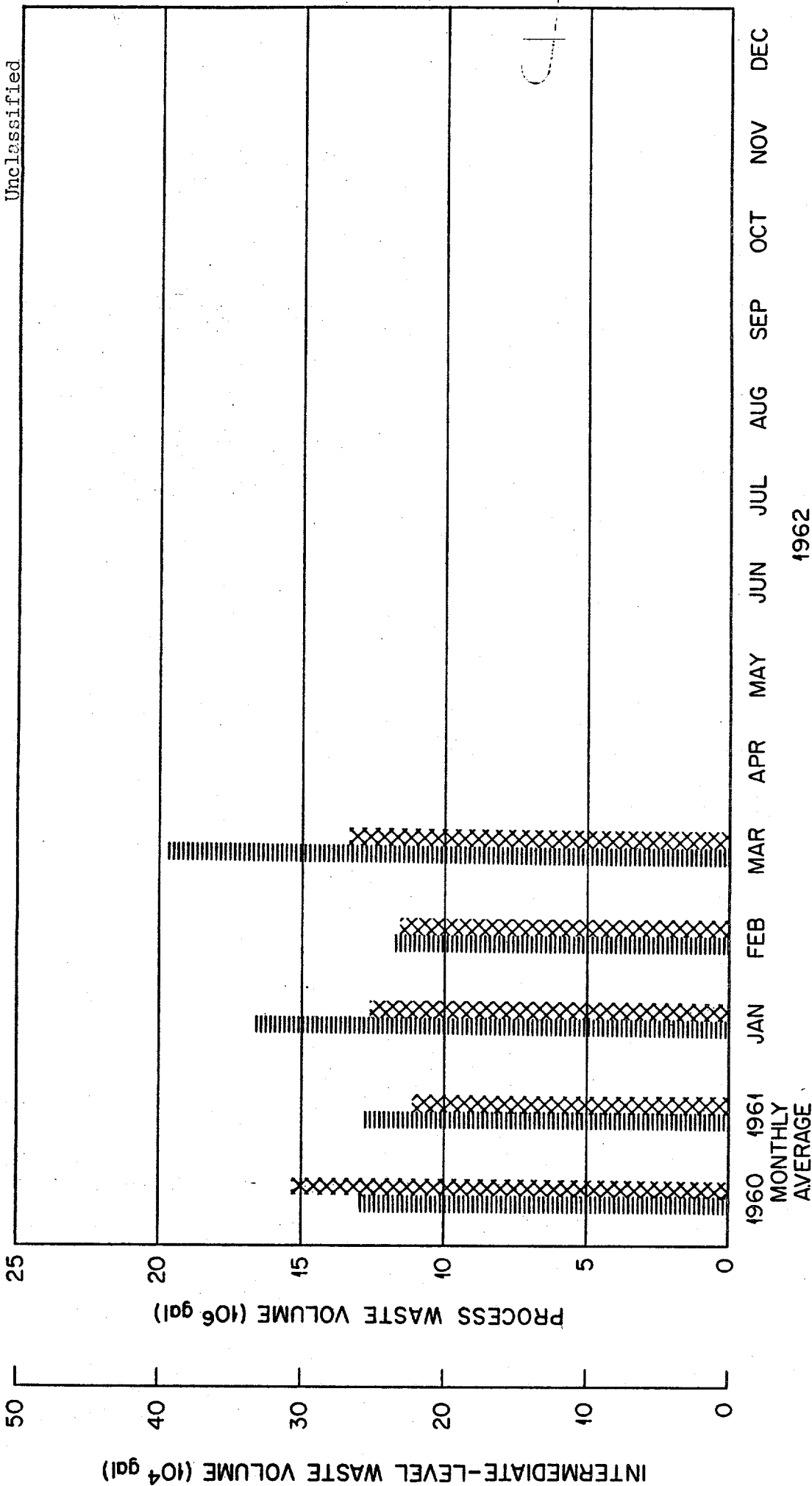


Fig. 2. Liquid Waste Volumes.

are given in Table 2.

Testing of the emergency catch basin and the transfer line and pumping station was successfully completed during the month.

Intermediate Level Waste

Storage facilities for intermediate level waste remained filled to capacity and nearly 400,000 gallons of waste were transferred to the disposal area. This represents an increase of 70% over the month of February.

Major contributors to the ILW system were as follows:

1. Radioisotopes Processing Area	73,100 gals
2. Building 3505	37,200 gals
3. Building 3019	34,500 gals
4. Fission Products Development Laboratory	29,300 gals
5. Reactor Operations	28,600 gals
6. 4500 Area	12,200 gals

A site was selected for a new covered storage trench and preliminary design of the facility was begun. ILW volumes are shown in Figure 2; transfer data are given in Table 3.

Creek Monitoring

Total activity and Sr activity discharges to White Oak Creek are shown in Figure 3. Data are presented for each month of 1962, and, for comparison, the average monthly discharges for 1961 are given. Total activity is arrived at by a summation of the activities found at Monitoring Stations Nos. 1 - 5 and appears in the Summary (Table 1) as "Total Liquid Waste Discharged to Environment".

Total activity discharges for the first quarter of 1962 show a downward trend. The March discharge, 357 curies, was 40% below the figure reported for February. The strontium record is not so encouraging, however, in that 1.1 curies were discharged during March compared with

TABLE II

PROCESS WASTE TREATMENT AND DISCHARGE TO WHITE OAK CREEK

WASTE VOLUME TREATED THIS MONTH: 12.4×10^6 Gal.TOTAL WASTE VOLUME DISCHARGED
TO WHITE OAK CREEK THIS MONTH: 13.4×10^6 Gal.

NUCLIDES	PLANT INFLUENT (Curies)	PLANT EFFLUENT (Curies)	PER CENT REMOVED	DISCHARGE TO WHITE OAK CREEK (Curies)
^{89}Sr	None Detected	None Detected	- -	None Detected
^{90}Sr	2.3	1.1	51	1.0
$^{103,106}\text{Ru}$	0.1	0.1	0	Less Than 0.01
^{60}Co	0.5	0.2	53	0.1
^{137}Cs	1.0	0.4	63	0.4
TRE	1.8	0.5	75	0.4
Total	5.7	2.3	60	1.9

TABLE III

ACTIVITY TRANSFERRED TO PITS AND TRENCH

NUCLIDE	TRENCH NO. 5, CURIES				PITS 2, AND 4, CURIES			
	This Month	Year to Date	Year 1961	Total to Date	This Month	Year to Date	Year 1961	Total to Date
Sr ⁸⁹	2	26	110	149	6	8	92	
Sr ⁹⁰	20	161	1,116	1,670	60	151	1,565	
Ru ¹⁰⁶	14	101	830	2,512	40	189	757	
Cs ¹³⁷	2,420	4,132	13,121	18,532	5,600	8,151	12,889	
TRE	32	319	41	1,038	72	183	837	
Total	2,488	4,774	16,181	24,899	5,778	8,712	16,148	509

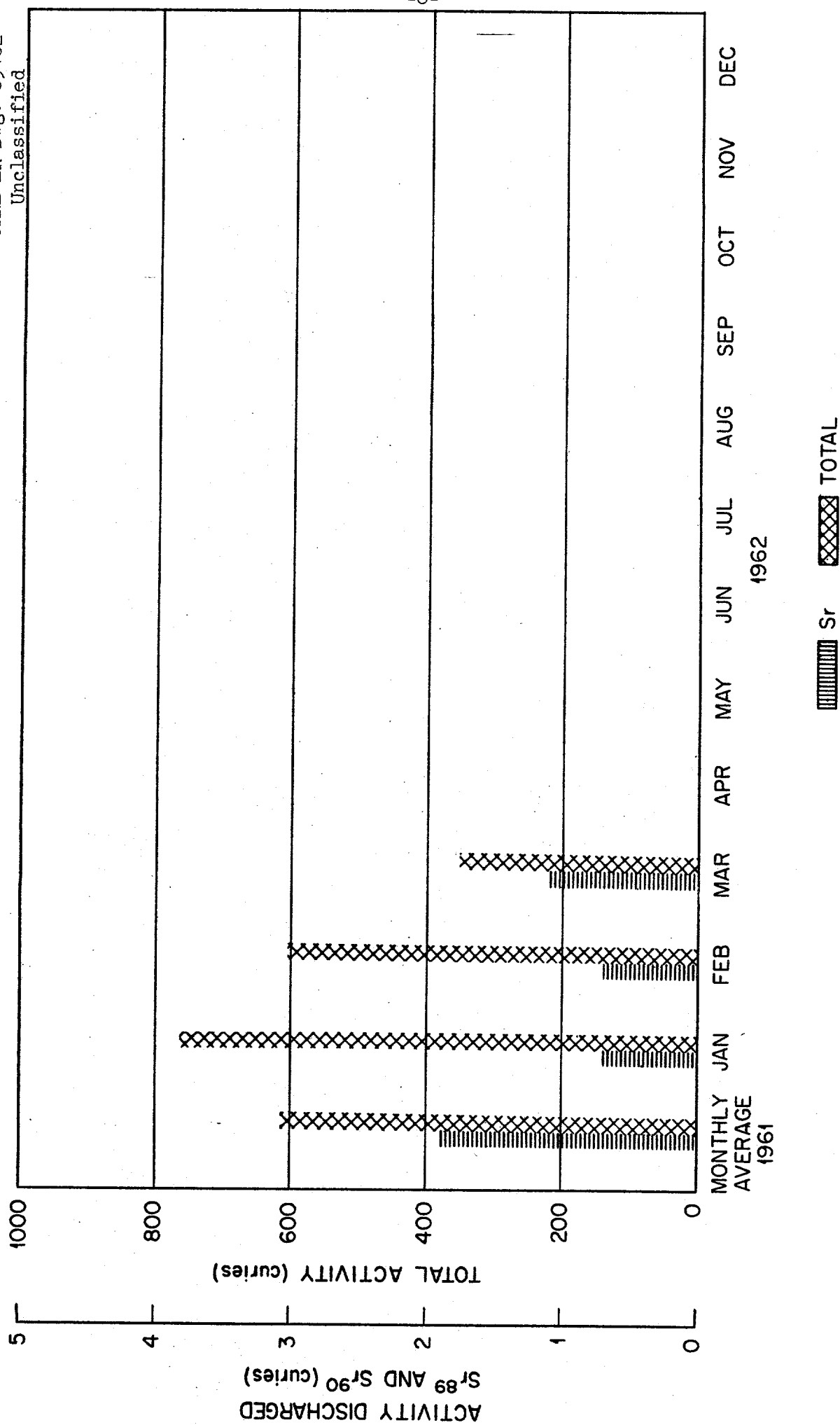


Fig. 3. Liquid Activity Discharge to White Oak Creek.

0.7 curies in February - a 60% increase. (This increase is discussed earlier). In spite of this increase, strontium releases for 1962 have stayed well below the monthly average for 1961. It will be noted that the total strontium released to the streams is in good agreement with the amount reported in the White Oak Dam discharge.

Gaseous Waste Monitoring

Figure 4 is a plot of gamma activity discharge data for each month of 1962 for the principal Laboratory stacks - 3039, 3018, and 3020. Shown on the plot are total activity, gaseous and particulate; and filterable activity, which includes particulate or any other type of activity which can be trapped or adsorbed by a filter.

The discharge of gaseous activity to the environment continues to decrease. The March release, 0.9 curies, was, once again, the lowest measured discharge on record. It must be kept in mind, however, that no effort is made to audit the rare gas emission. Also, due to the location of the inventory sampler on the 3039 stack, sampling losses are undoubtedly high and release data calculated from the analysis of samples taken at this point may be low by as much as a factor of 10.

Off-Gas System

Service was normal during the period.

Waste Monitoring Control Center

Further progress was made in the transfer of monitoring functions to the control center, as follows:

1. ON-OFF indicators were installed on major pieces of equipment at the Waste Treatment Plant. These give a visual indication at the control center of the operating status of the treatment plant.

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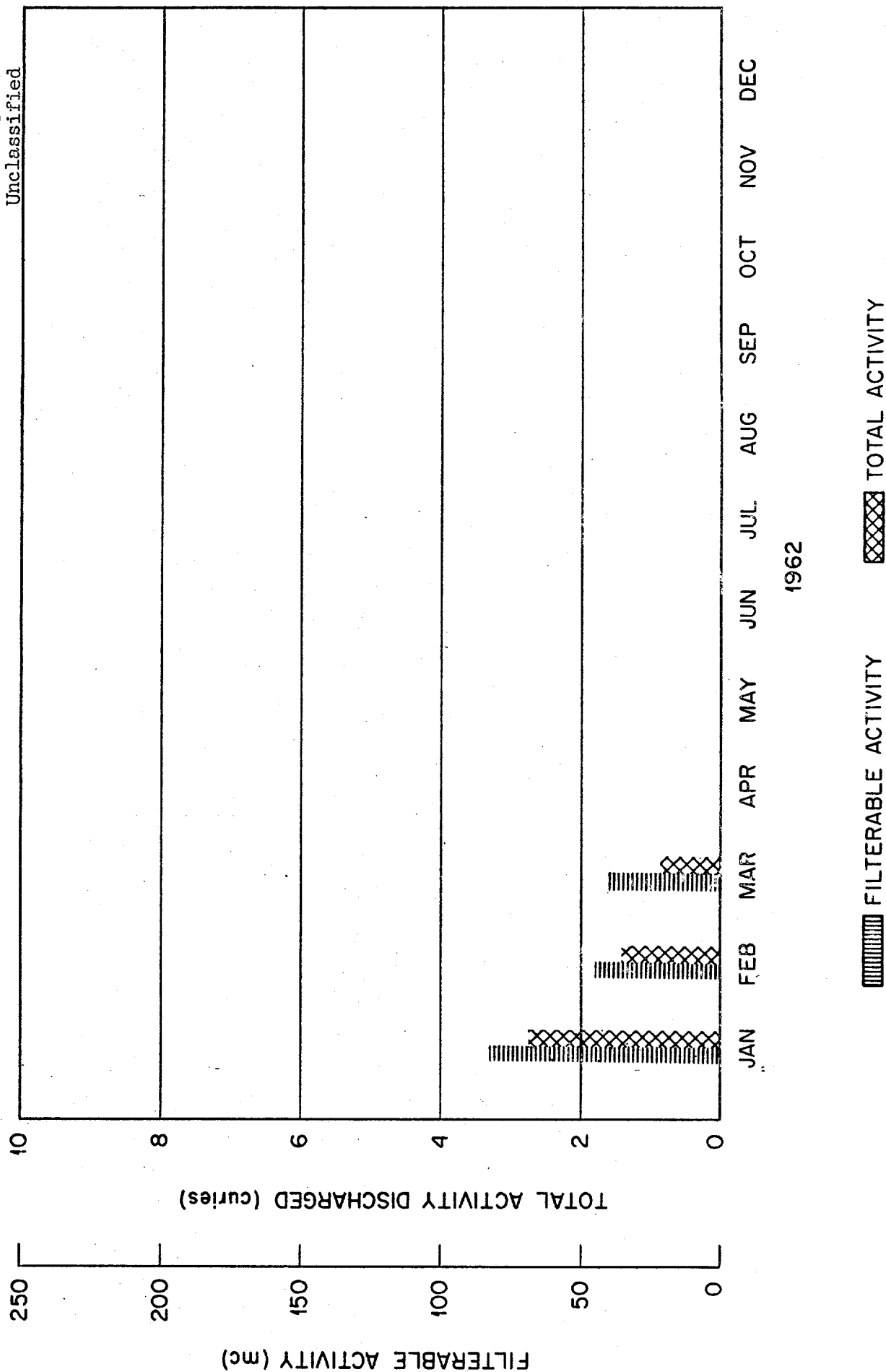


Fig. 4. Gaseous Activity Discharge to Environment.

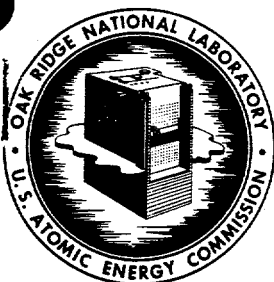
2. Electrical work was started on the 3039 Stack service balcony. In addition to power and light, the necessary conduit is being run to carry signal cable from the stack monitoring instruments on the balcony to recorders in the control center. This work will continue until provisions are made for similar connections to all stack area and off-gas monitoring devices.
3. The installation of telemetering lines was begun between the ILW monitoring tanks and the control center. When this is completed the level recorders at the Waste Treatment Plant will be relocated at the control center.

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CENTRAL FILES NUMBER
62-7-16

DATE: July 6, 1962

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SUBJECT: LABORATORY FACILITIES - WASTE DISPOSAL
Report for May 1962

TO: Distribution

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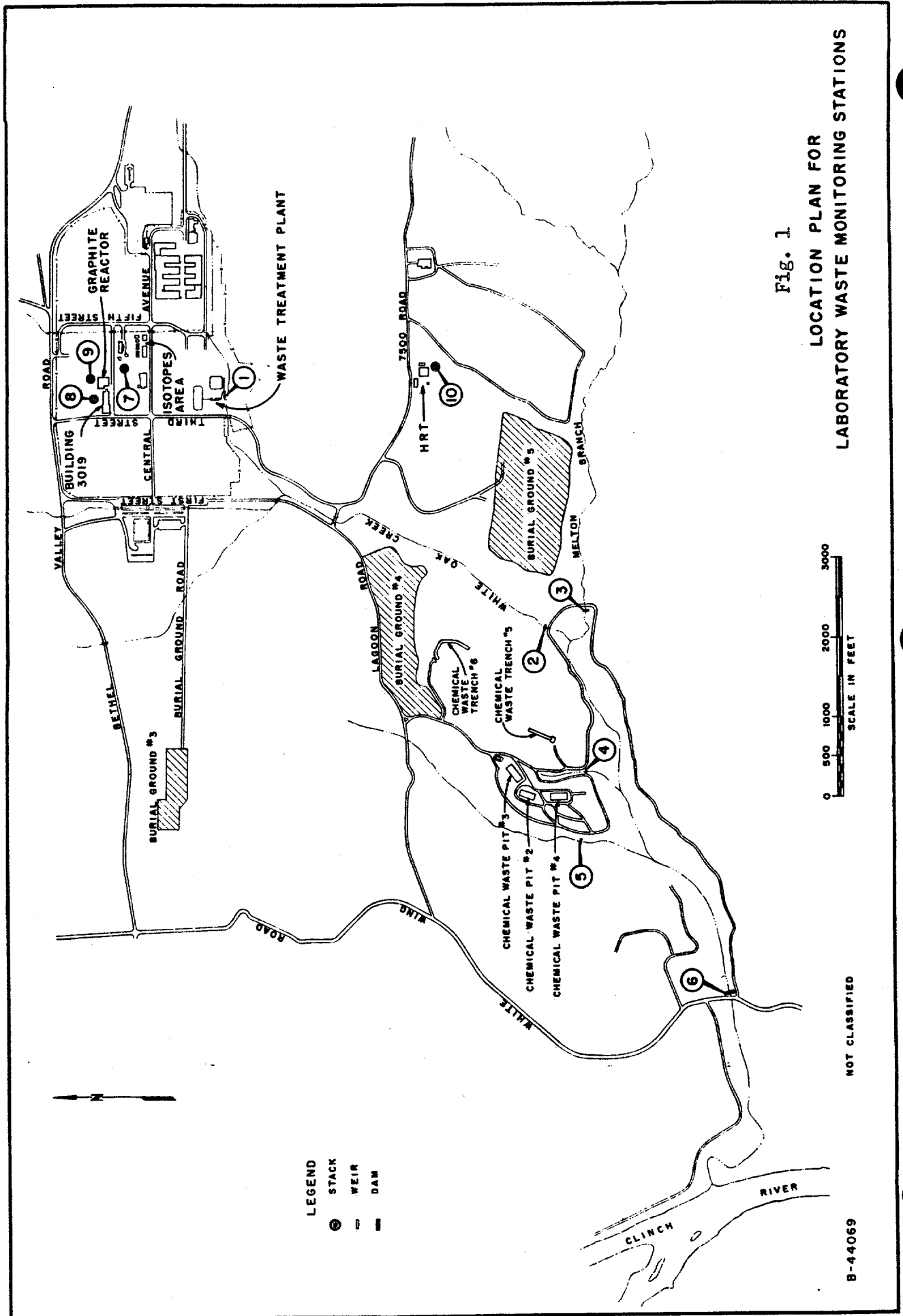
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		Sr ⁹⁰	Ru ¹⁰⁶	Cs ¹³⁷	TOTAL ²
Liquid Waste					
Process Waste to White Oak Creek	1	0.9	0.2	0.3	2.1
Burial Ground No. 4 and Miscellaneous Laboratory Drainage to White Oak Creek	2	0	0	0	0
7500 Waste to Melton Branch	3	0.015	0.005	0.005	0.04
East Waste Pit Seepage to White Oak Creek	4	0.0008	341.	0.04	347.
West Waste Pit Seepage to White Oak Creek	5	0.045	281.	0.01	285.
Total Liquid Waste Discharged to White Oak Lake		0.9	622.	0.4	634.
White Oak Dam to Clinch River	6	0.6	17.	0.02	22.
Gaseous Waste ³					
3039 Stack	7				14.40
3020 Stack	8			Less than	0.01
3018 Stack	9				0.04
7500 Stack	10				-
Total Gaseous Waste Discharged to Environment					14.44

¹ Refers to Fig. 1.

² Includes other nuclides not listed here.

³ Activity primarily I¹³¹ as noted in text.



A comparison of this month's volume to that of previous months is shown in Figure 2; the operational data for the treatment plant is given in Table 2 .

A review of the daily releases recorded by the process waste monitors suggests that a large portion of the high volume is discharged into the system through improper piping connections and careless operations. This becomes apparent in some areas on weekends when all or most of the work is curtailed but there is no corresponding decrease in the volume of waste released. In the 4500 Complex, for example, the rate of waste release on Saturdays and Sundays, during the month of May, was only 40% lower than it was during the other five days of the week.

Intermediate Level Waste

415,000 gallons of intermediate level waste were transferred to the soil disposal area during the month, an increase of 33% over the total for April. Process work at the 3505 canal was a principal contributor; much of the remainder had been accumulated during the wet season. Major users of the system were, as follows:

1. Building 3505 Canal	96,000 gal
2. Reactor Operations	44,400 gal
3. Building 3019	26,000 gal
4. Fission Products Development Laboratory	23,700 gal
5. Radioisotopes Processing Area	20,900 gal
6. 4500 Area	12,700 gal

Intermediate level waste volumes are shown in Figure 2; transfer data is given in Table 3.

Creek Monitoring

Six hundred thirty four curies of activity was released to White Oak Creek from all sources during the month of May. This is an 80% increase over

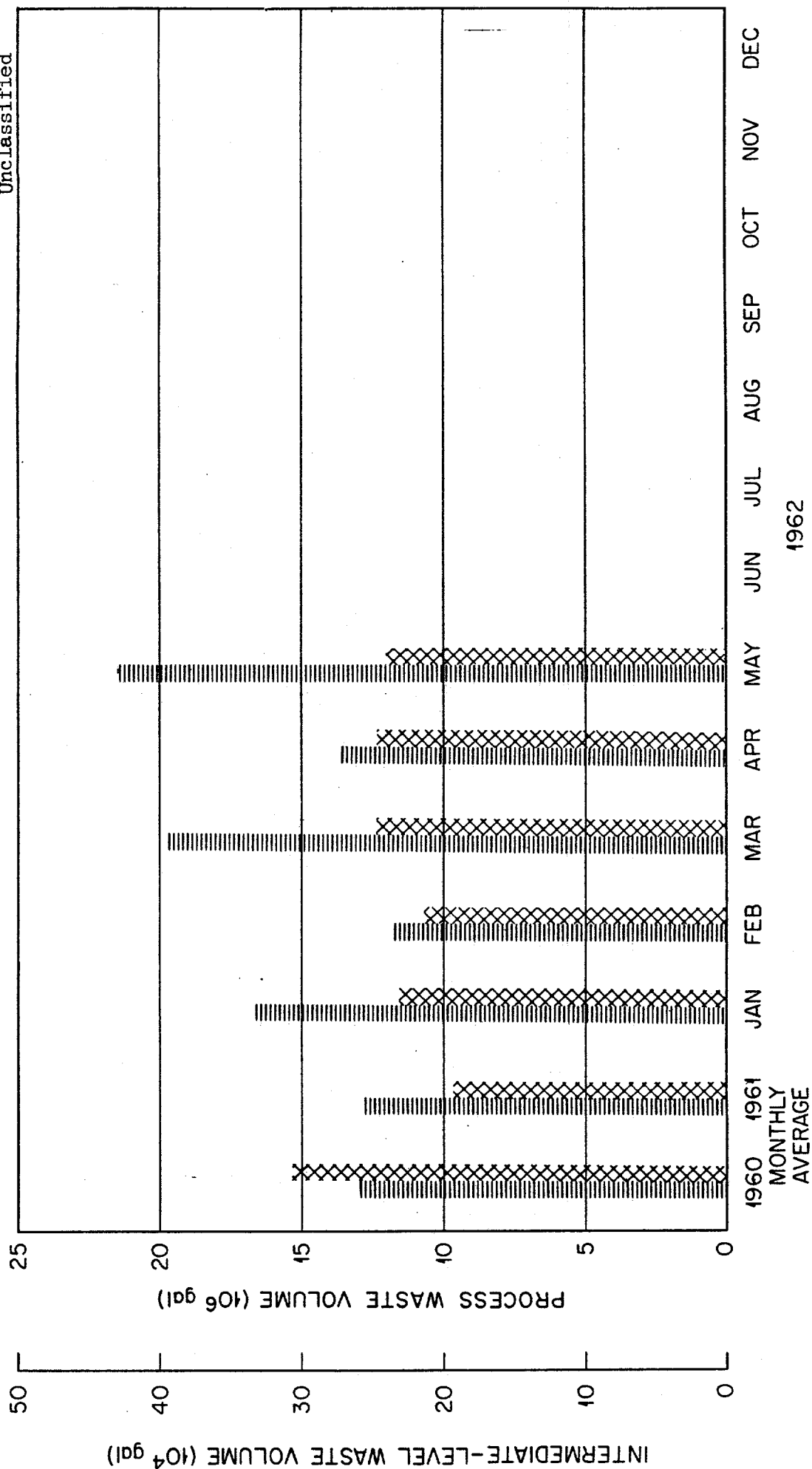


Fig 2 Liquid Waste Volumes.

Table 2

PROCESS WASTE TREATMENT AND DISCHARGE TO WHITE OAK CREEK

WASTE VOLUME TREATED THIS MONTH:

TOTAL WASTE VOLUME DISCHARGED
TO WHITE OAK CREEK THIS MONTH:

NUCLIDES	PLANT INFLUENT (Curies)	PLANT EFFLUENT (Curies)	PER CENT REMOVED	DISCHARGE TO WHITE OAK CREEK (Curies)
⁸⁹ Sr	-	-	-	-
⁹⁰ Sr	2.2	0.9	59	0.9
^{103,106} Ru	0.1	0.04	60	0.2
⁶⁰ Co	0.4	0.1	75	0.02
¹³⁷ Cs	0.9	0.3	67	0.3
TRE	2.8	1.0	64	0.7
Total	6.4	2.3	64	2.1

Table 3

ACTIVITY TRANSFERRED TO PITS AND TRENCH

NUCLIDE	TRENCH NO. 5, CURIES				PITS 2, AND 4, CURIES			
	This Month	Year to Date	Year 1961	Total to Date	This Month	Year to Date	Year 1961	Total to Date
Sr ⁸⁹	-	26	110	149	-	8	92	
Sr ⁹⁰	128	328	1116	1837	763	971	1565	
Ru ¹⁰⁶	57	173	830	2586	48	256	757	
Cs ¹³⁷	993	7385	13121	21785	2068	11744	12889	
TRE Co ⁶⁰	24	-	-	-	35	-	-	
TOTAL TRE	100	463	41	1182	556	801	837	
TOTAL	1302	8442	16181	28567	3470	14930	16148	515

the amount reported in the preceding month and is attributed to heavy loading of the disposal pits and rainfall, following a dry spell, that washed out activity accumulated in the swamp area. The strontium discharge, mainly from the process waste system, was reduced from 1.4 curies, measured last month, to 0.9 curies. A plot of activity discharges to the stream system, showing releases for each month of the year, is given in Figure 3.

The total activity discharged into the river during the same period, measured by Health Physics at the dam, was only 22 curies. The great difference between the activity measured at the dam and that measured by the creek monitors was in the Ru^{106} released from the waste pits. It may be accounted for by the fact that the rainfall previously mentioned, came at the very end of the month. Although an upward trend was noted at the dam during the last three days, the bulk of the activity did not have time to reach the dam before the end-of-the-month sample was taken.

Gaseous Waste

Practically all of the activity released into the atmosphere this month was I^{131} from the 3039 stack. The total discharge was between 14 and 32 curies but only eight curies could be identified with any certainty with the I^{131} production process. The total amount could not be measured with an acceptable degree of accuracy and the source of the balance of the activity and the time of release could not be determined because of the inadequacy of the monitoring equipment. The status of the stack monitoring equipment is covered in the April report and in another section of this report, "Waste Monitoring Control Center".

A comparison of activity discharges in recent months is shown in Figure 4. The discharge in May is higher than any in more than a year even if the lowest possible discharge for May is assumed to be correct.

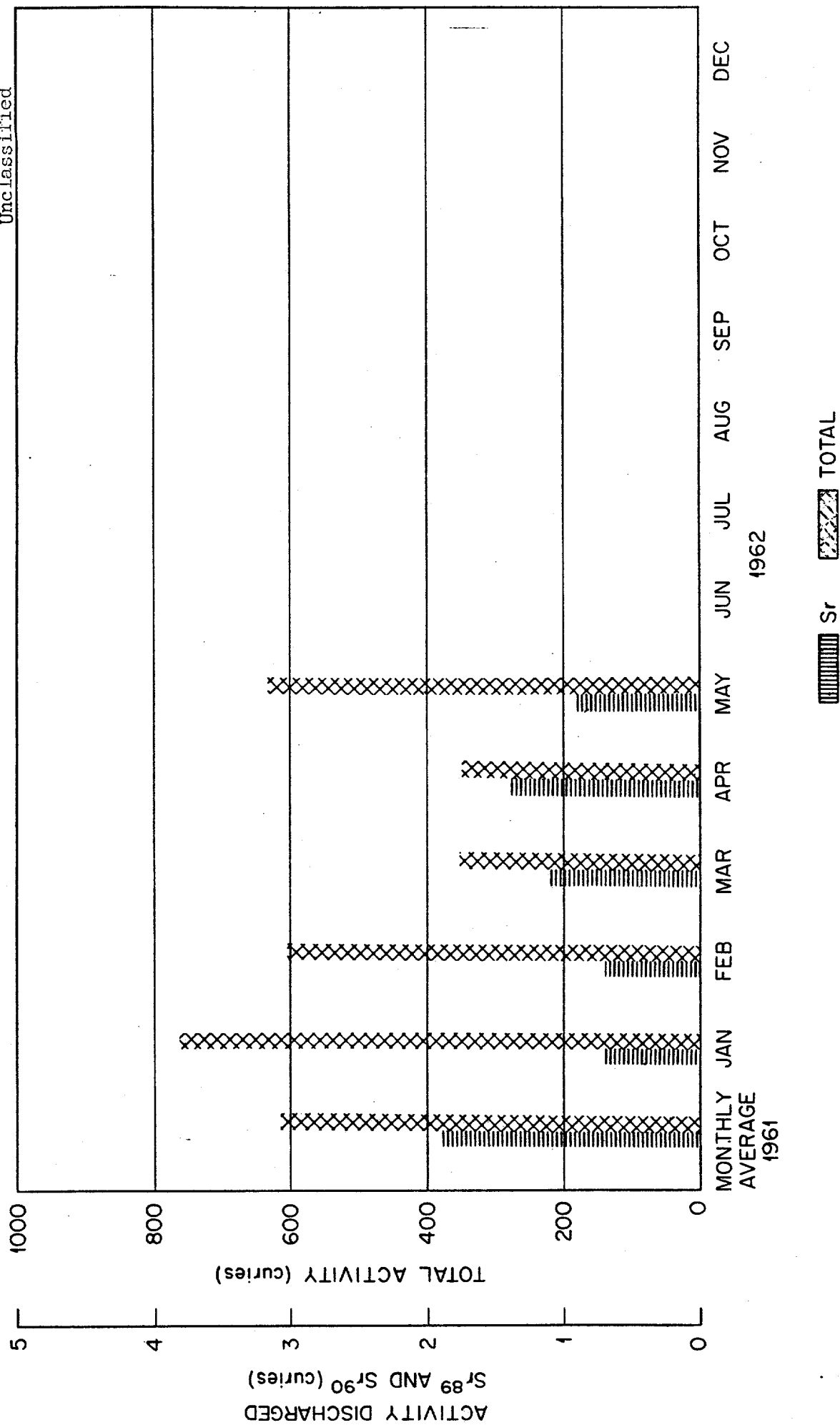


Fig. 3. Liquid Activity Discharge to White Oak Creek.

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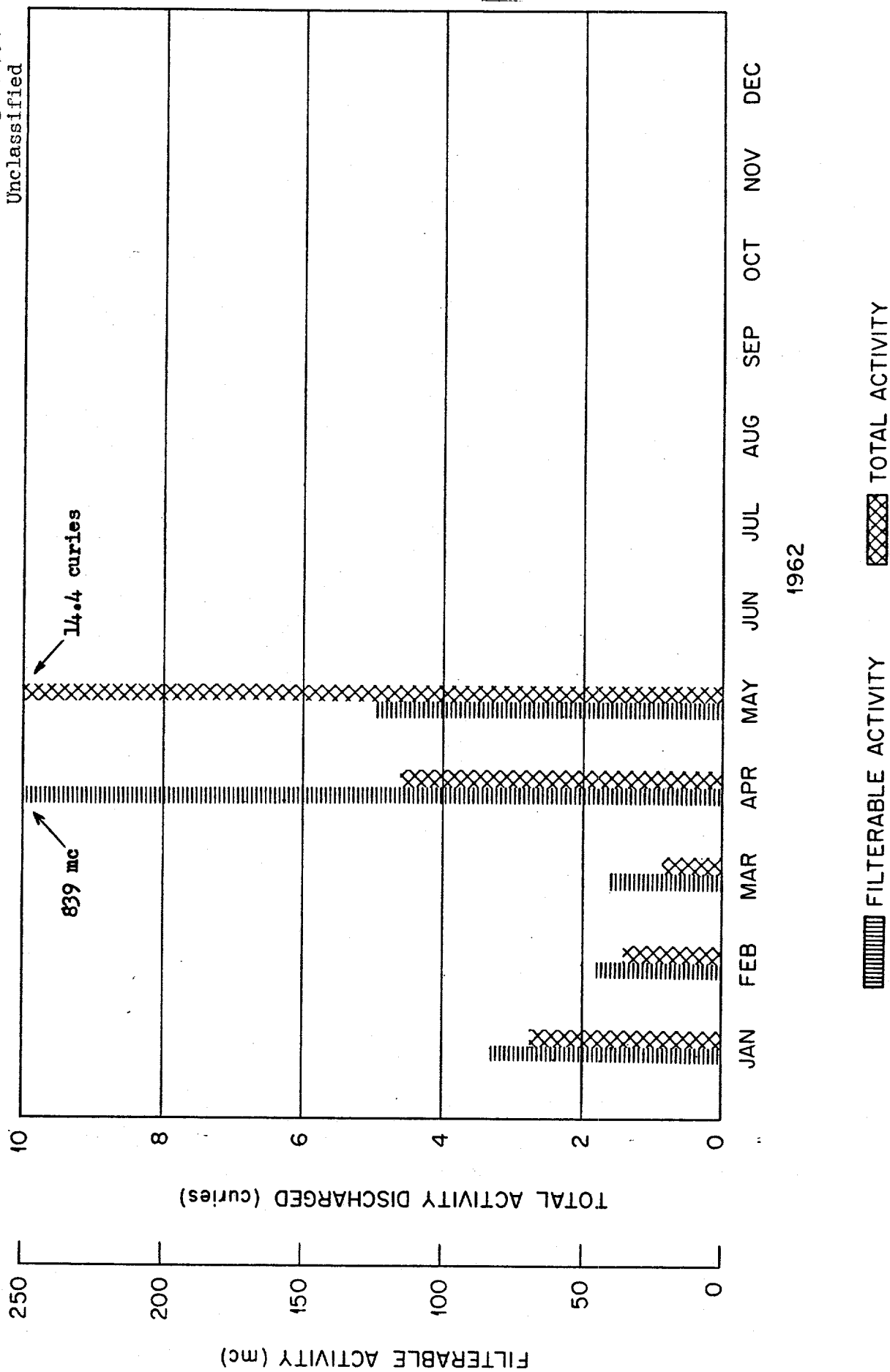


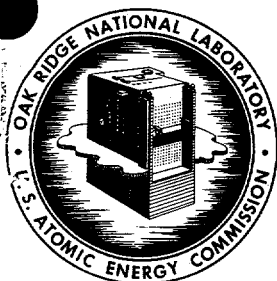
Fig. 4. Gaseous Activity Discharge to Environment.

Off-Gas System

This equipment operated without incident during the period. The filtration system was tested by the Inspection and Engineering Department and efficiencies of 98.8% and 95.9% were found for the north and south filter banks, respectively.

Waste Monitoring Control Center

Read-out on the ILW tank level monitoring system is now being transferred to the Control Center. Installation of telemeter lines has been completed by the telephone company and instrument work is underway at both ends. Conduit and cable work in the 3039 Stack area, needed before the gaseous waste monitoring equipment can be made functional, is still underway. Lack of priority and the consequent frequent loss of manpower on all phases of field work connected with the monitoring system have extended the completion date far beyond original estimates. At this time it is not possible to state with any assurance when the overall waste monitoring system will be in full operation.



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DATE: January 30, 1963
SUBJECT: LABORATORY FACILITIES - WASTE DISPOSAL
Report for December 1962
TO: Distribution
FROM: J. F. Manneschildt

This document has been approved for release
to the public by:

David R. Hamlin *7/17/95*
Technical Information Officer Date
ORNL Site

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Inventory of Total Activity Discharged

An inventory of the total radioactivity released to the environment by the Laboratory during the month of December is given in Table 1. Released quantities of the three important nuclides - Sr, Ru¹⁰⁶, and Cs¹³⁷ - are also given in this table. Discharge data was gotten from samples taken routinely at the process waste monitoring stations and diversion box; from White Oak Creek and Melton Branch; from the seepage streams in the soil disposal area; and from the three principal process stacks. Locations of the monitoring stations are shown in Figure 1. The amount of radioactivity contributed by the source titled, "Burial Ground No. 4 and Miscellaneous Laboratory Drainage to White Oak Creek", was gotten by difference between the activity measured in the process waste discharge (Monitoring Station No. 1) and that found in White Oak Creek just north of its confluence with Melton Branch (Monitoring Station No. 2). Data on the White Oak Dam release was obtained from the Environmental Monitoring Group of the Health Physics Division.

Process Waste Treatment and Discharge to White Oak Creek

During the month of December approximately 14 million gallons of low level waste were generated by the Laboratory (See Figure 2). After treatment, 0.4 curies of activity, about half of which was strontium, was released to White Oak Creek. The removal efficiency for this nuclide at the treatment plant remained steady at about 80%. Operational data for the waste treatment plant is given in Table 2.

The average monthly volume of process waste produced by the Laboratory during 1962 was 13.3 million gallons. This is 37% greater than the

TABLE 1

SUMMARY OF TOTAL LIQUID AND GASEOUS ACTIVITY DISCHARGED

SOURCE	MONITORING STATION NUMBER ¹	ACTIVITY (Curies)			
		Total Sr	Ru ¹⁰⁶	Cs ¹³⁷	TOTAL ²
Liquid Waste					
Process Waste to White Oak Creek	1	0.2	< 0.1	< 0.1	0.2-0.4
Burial Ground No. 4 and Miscellaneous Laboratory Drainage to White Oak Creek ⁴	1,2	0.3	≤ 0.5	≤ 0.2	0.3-1.0
7500 Waste to Melton Branch	3	Individual Nuclides not identified			0.6
East Waste Pit Seepage to White Oak Creek	4	0.0009	144.	0	145.
West Waste Pit Seepage to White Oak Creek	5	0.0016	92.	0	93.
Total Liquid Waste Discharged to White Oak Lake		0.5	236.	< 0.3	239.
White Oak Dam to Clinch River	6	0.7	78.1	0.2	80.7
Gaseous Waste ³					
3039 Stack	7				5.29
3020 Stack	8				< 0.01
3018 Stack	9				0.23
Total Gaseous Waste Discharged to Environment					5.52

¹ Refers to Fig. 1.

² Includes other nuclides not listed here.

³ Activity primarily I¹³¹ as noted in text.

⁴ Activity from these sources gotten by difference between the activities measured at Stations 1 and 2.

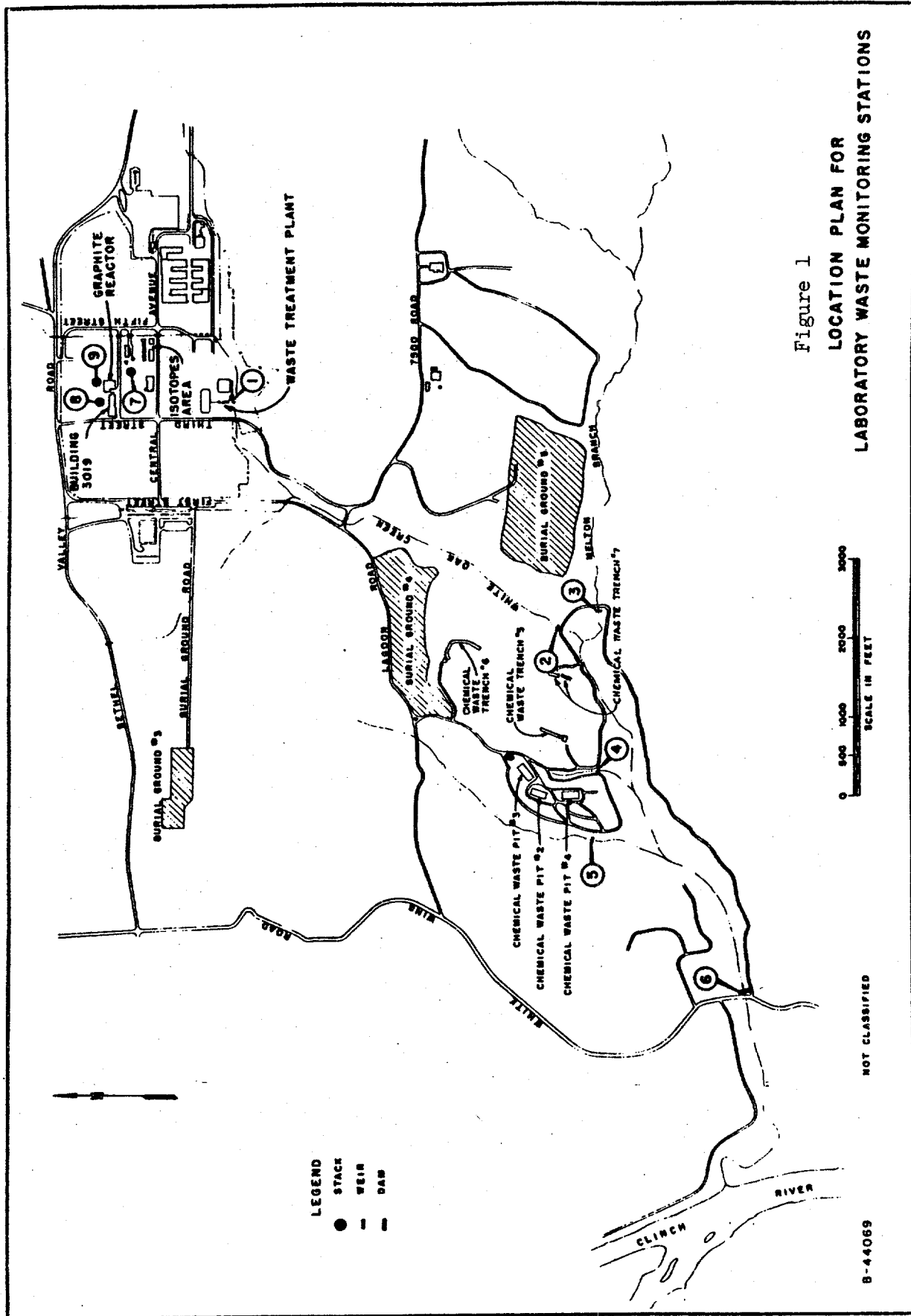


Figure 1
LOCATION PLAN FOR
LABORATORY WASTE MONITORING STATIONS

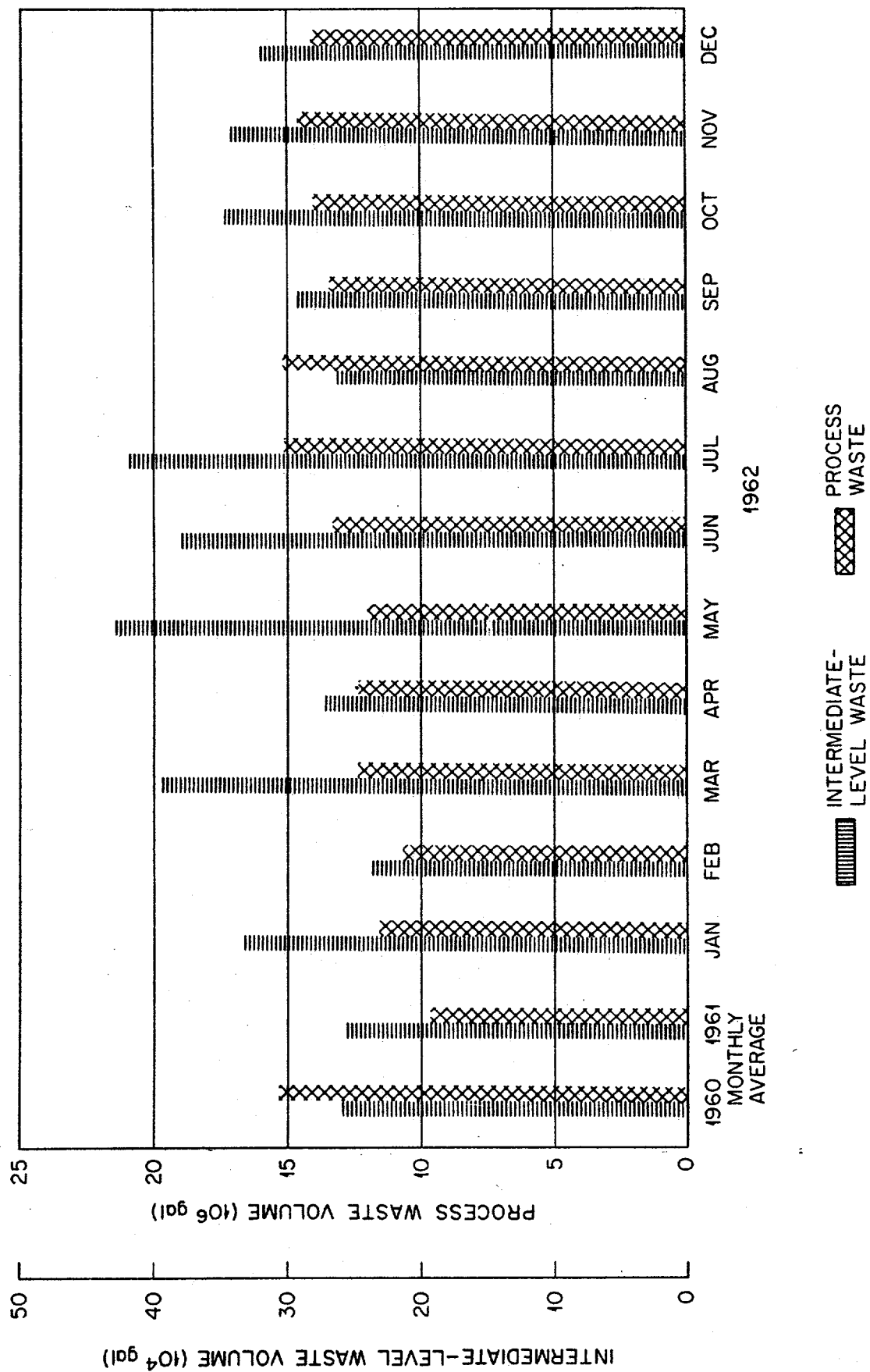


Fig. 2. Liquid Waste Volumes.

TABLE 2

PROCESS WASTE TREATMENT AND DISCHARGE TO WHITE OAK CREEK

WASTE VOLUME TREATED THIS MONTH: 14.2×10^6 gals

TOTAL WASTE VOLUME DISCHARGED
TO WHITE OAK CREEK THIS MONTH: 14.9×10^6 gals

NUCLIDES	PLANT INFLUENT (Curies)	PLANT EFFLUENT AND SETTLING BASIN DIS- CHARGE (Curies)	PERCENT REMOVED BY TREATMENT PLANT AND SETTLING BASIN
Total Sr ¹	0.9	0.2	80
Ru ^{103,106}	< 0.1	< 0.1	-
Co ⁶⁰	0	0	-
Cs ¹³⁷	0.7	< 0.1	86-100
TRE	0	0	-
Total	1.6-1.7	0.2-0.4	75-88

¹Past analyses indicate that "Total Sr" is greater than 90% Sr⁹⁰.

1961 monthly average (9.7 million gallons).

Table 3 lists the principal contributors to the process waste system and gives the volume of waste and the total activity discharged by each.

Intermediate Level Waste

Three hundred thousand gallons of intermediate level waste were transferred to the disposal trenches during the period (See Figure 2).

Distribution was, as follows:

1. Trench No. 6	160,500 gallons
2. Trench No. 7-A	97,900 gallons
3. Trench No. 7-B	63,900 gallons

Filling operations at Pit No. 2 are still in progress; completion by late January is anticipated.

Prime users of the ILW system during December were, as follows:

1. Reactor Operations	70,100 gallons
2. Building 3019	54,700 gallons
3. Fission Products Development Laboratory	33,700 gallons
4. 4500 Area	30,300 gallons
5. Radioisotopes Processing Area	26,200 gallons
6. Building 3505 (Canal)	25,200 gallons
7. Building 3505 (Accidental rupture of water line)	14,000 gallons

Complete transfer data on this system is given in Table 4.

The average monthly volume of intermediate level waste processed during 1962 was 340,000 gallons, or 30% more than the average for 1961

TABLE 3

PROCESS WASTE DISCHARGES

SOURCE	GROSS BETA ACTIVITY AVERAGE, c/m/ml	GROSS ACTIVITY		VOLUME	
		MILLICURIES	% OF TOTAL	GAL x 10 ⁶	% OF TOTAL
1. Reactor Operations and Decontamination Facility	15	450	70	2.2	17
2. Radioisotopes Processing Area	20	108	17	0.4	3
3. Buildings 3025 and 3026	2	46	7	1.7	13
4. Buildings 3503 and 3508	4	43	7	0.8	6
5. 4500 Area	0	0	0	7.1	55
6. Building 3019	0	0	0	0.4	3
7. Fission Products Development Laboratory	-	-	-	0.4	3

TABLE 4
ACTIVITY TRANSFERRED TO PITS AND TRENCHES

NUCLIDE	PITS 2, 3, AND 4 ¹ , curies			TRENCH NO. 5, curies			TRENCH NO. 7-A, curies			TRENCH NO. 7-B, curies		
	This Month	Year to Date	Total to 1961 Date	This Month	Year to Date	Total to 1961 Date	This Month	Year to Date	Total to Date	This Month	Year to Date	Total to Date
TOTAL Sr	None	1513	1657	30	1354	1226	15	38	38	10	32	22
Ru ¹⁰⁶	None	741	757	468	1274	830	242	358	358	158	307	117
Cs ¹³⁷	None	17561	12889	690	14749	13121	603	1588	1588	393	1668	1275
Co ⁶⁰	None	111	-	15	153	-	9	11	11	6	9	3
TRE	None	1141	855	-	608	956	-	6	6	-	5	5
TOTALS ²	None	21070	16148	522505	18138	16193	869	2001	2001	567	1989	1422

¹ All pits are out of service at this time.

² Includes other nuclides not listed here.

(260,000 gallons).

Creek Monitoring

The December total discharge to the White Oak Creek system was slightly greater than that experienced in November (See Figure 3); however, the increase was not enough to upset the downward trend which has been evident during the last half of 1962. A total release of 239 curies was measured in December; the average for the year was 448 curies per month. This is 27% below the average for 1961. The strontium release for the month was 0.5 curies which is only a little below the average for the year of 0.7 curies per month. The 1962 average is well below (63%) the 1961 figure of 1.9 curies per month, and is probably the most significant change noted in the entire waste disposal operation. It is interesting to note that although the total activity discharge has steadily declined during the year, strontium releases have oscillated above and below the average with little net change since the first of the year.

An abandoned drain line which has plagued the waste disposal operation with spurious releases of activity during the past several months was finally plugged. It is too soon to evaluate what has been accomplished by making this repair.

Gaseous Waste

Total activity emitted from the process stacks amounted to 5.5 curies (See Figure 4). This was an increase over the discharge reported for November, but 50% below the average for the year (10.1 curies). Thirty one millicuries of filterable activity were measured. This is the lowest discharge of this type of activity reported this year and is 80%

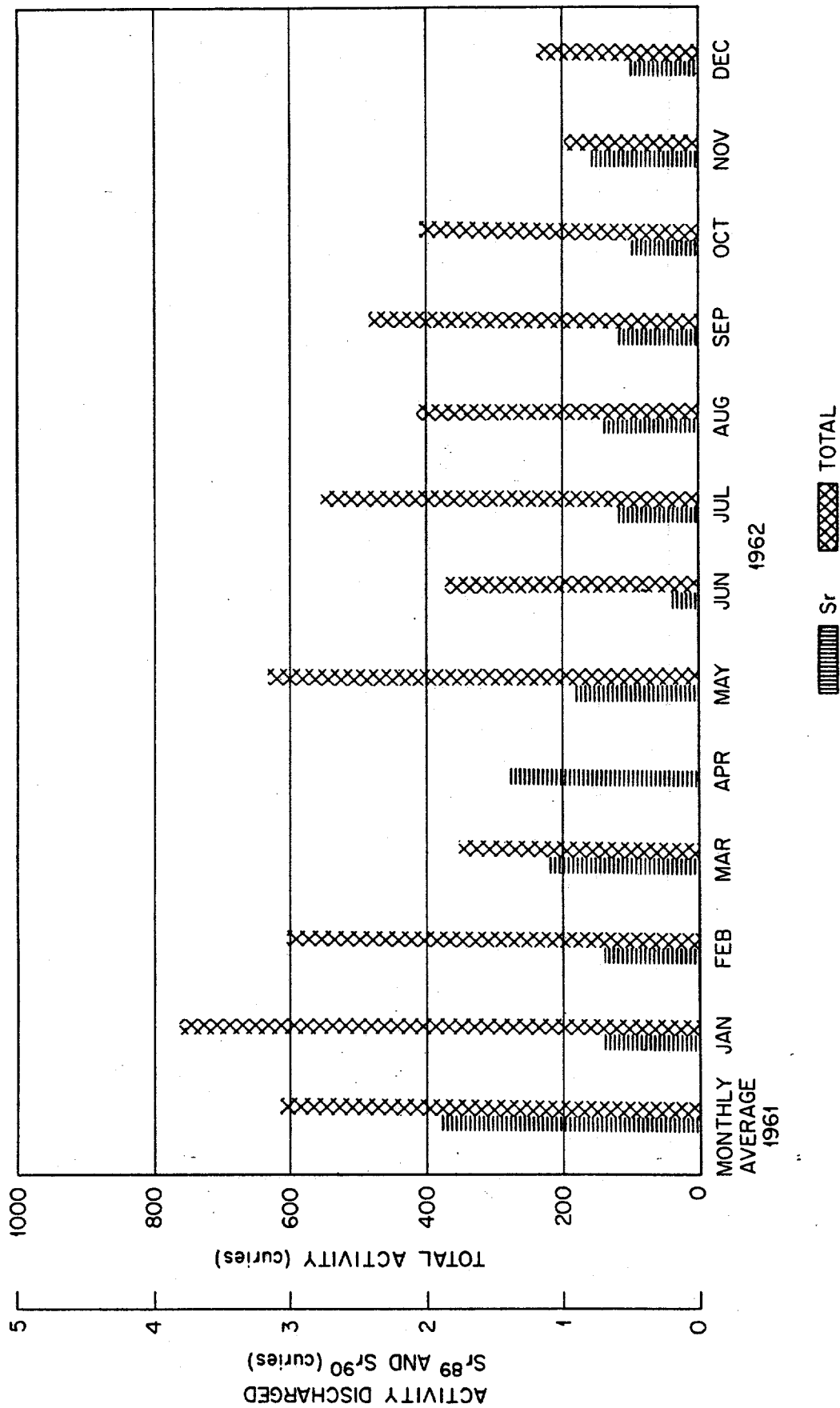


Fig. 3. Liquid Activity Discharge to White Oak Creek.

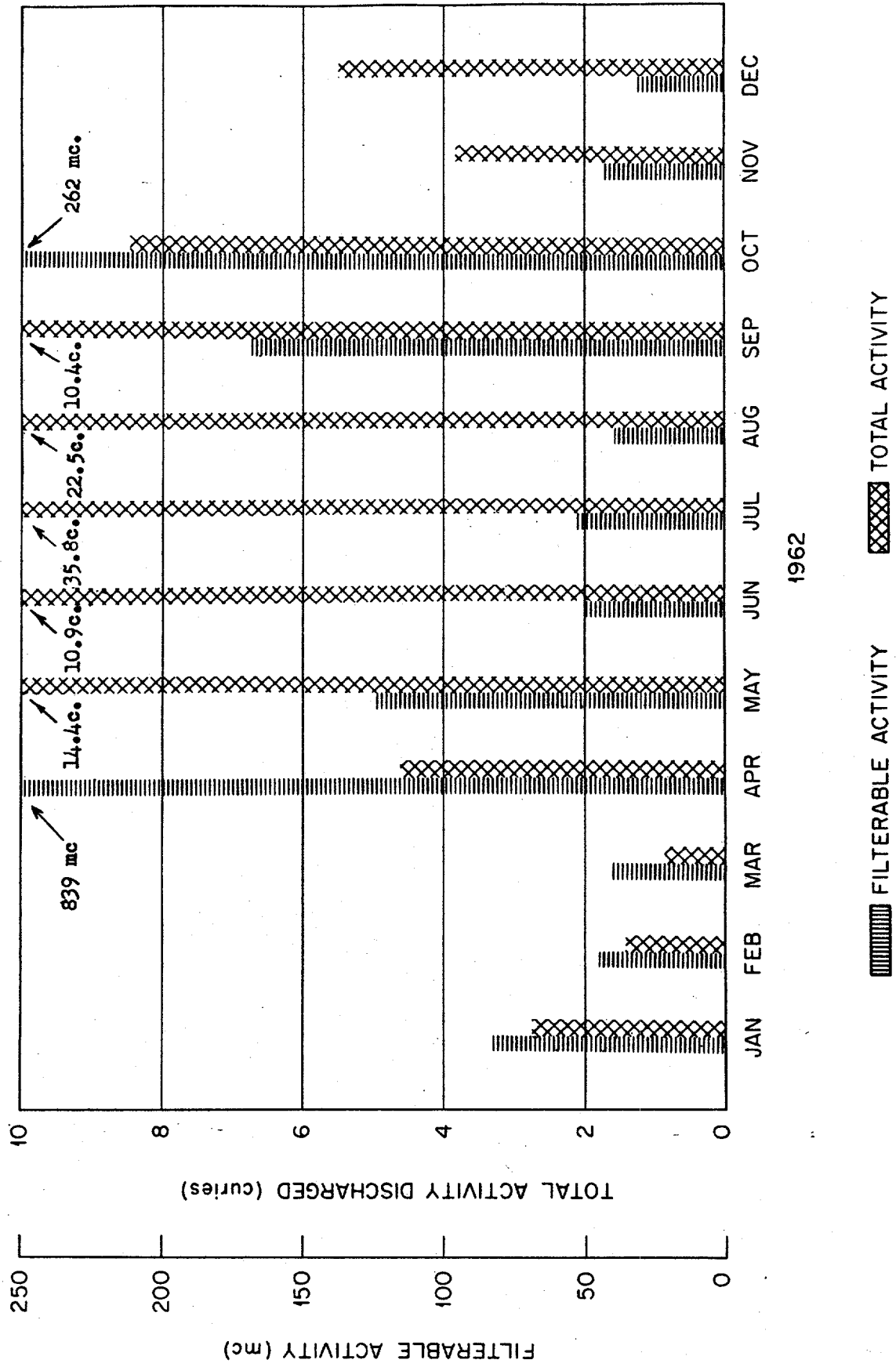


Fig. 4. Gaseous Activity Discharge to Environment.

below the average for 1962 (149 mc.). The yearly averages would probably have been higher but for the fact that the instack samplers were not in operation during the first quarter.

One bank of absolute filters in the off-gas facility was changed during the month; otherwise, operation of the gaseous waste handling equipment was normal.